

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-13 (canceled).

Claim 14 (currently amended): An optical sheet comprising a plurality of lens elements provided successively in a row on one of principal faces of said optical sheet,

wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis is taken in a direction of the row of said lens elements, a cross sectional shape in the XZ plane of each of said lens elements has a hyperboloidal or paraboloidal structure in which an entire surface of each of said lens elements satisfies the following expression:

$$Z = X^2/(R + \sqrt{R^2 - (1 + K)X^2}) + AX^4 + BX^5 + CX^6 + \dots$$

where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, C, ... are aspheric coefficients, and

wherein the radius R of curvature, the conic constant K and the aspheric coefficients A, B, C, ... satisfy the following numerical ranges: $R \geq 0$, $K \leq -1$, $0 < A < 10^{-3}$, and $0 \leq B, C \dots < 10^{-3}$.

Claim 15 (canceled).

Claim 16 (previously presented): The optical sheet according to claim 14, wherein the radius R of curvature, the conic constant K and the aspheric coefficients A, B, C, ... satisfy the following numerical ranges:

$$0 < R \leq 72$$

$$-15 < K \leq -1$$

$$R - K \geq 5$$

$$0 \leq A, B, C \dots < 10^{-3}.$$

Claim 17 (previously presented): The optical sheet according to claim 14, wherein the radius R of curvature, the conic constant K and the aspheric coefficients A , B , C , ... satisfy the following numerical ranges:

$$0 < R \leq 30$$

$$-15 < K \leq -1$$

$$R - K \geq 5$$

$$0 \leq A, B, C \dots < 10^{-3}.$$

Claim 18 (previously presented): The optical sheet according to claim 14, further comprising convex portions having a height equal to or greater than $0.20 \mu\text{m}$ from an average central plane on the principal face side opposite to the principal face on which said lens elements are provided, wherein the density of said convex portions is equal to or higher than $70 / \text{mm}^2$ but equal to or lower than $500 / \text{mm}^2$.

Claim 19 (previously presented): The optical sheet according to claim 14, further comprising convex portions having a height equal to or greater than $0.20 \mu\text{m}$ from an average central plane on the principal face side opposite to the principal face on which said lens elements are provided, wherein the average distance between said convex portions is equal to or greater than $50 \mu\text{m}$ but equal to or smaller than $120 \mu\text{m}$.

Claim 20 (previously presented): The optical sheet according to claim 14, further comprising convex portions on the principal face side opposite to the one principal face on which said lens elements are provided, wherein said convex portions are provided such that, in a state wherein said lens elements are not formed, the cloudiness degree of said optical sheet is equal to or lower than 60%.

Claim 21 (previously presented): The optical sheet according to claim 14, further comprising convex portions on the principal face side opposite to the one principal face on which said lens elements are provided, wherein said convex portions are provided such that, in a state

wherein said lens elements are not formed, the cloudiness degree of said optical sheet is equal to or lower than 20%.

Claim 22 (previously presented): The optical sheet according to claim 14, further comprising convex portions on the principal face side opposite to the one principal face on which said lens elements are provided, wherein the ten-point average roughness SRz of said convex portions is equal to or higher than 1 μm but equal to or lower than 15 μm .

Claim 23 (previously presented): The optical sheet according to claim 14, further comprising convex portions on the principal face side opposite to the one principal face on which said lens elements are provided, wherein the height of said convex portions at which the convex portion area occupies 1% is equal to or greater than 1 μm but equal to or smaller than 7 μm .

Claim 24 (previously presented): The optical sheet according to claim 14, further comprising convex portions on the principal face side opposite to the one principal face on which said lens elements are provided, wherein the average inclination gradient of the face on the side on which said convex portions are provided is equal to or lower than 0.25.

Claim 25 (currently amended): A backlight, comprising:
a light source for emitting illumination light; and
an optical sheet for raising the directivity of the illumination light emitted from said light source, said optical sheet comprising, on the illumination light emission side thereof, a plurality of lens elements provided successively in a row,

wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis is taken in a direction of the row of said lens elements, a cross sectional shape in the XZ plane of each of said lens elements has a hyperboloidal or paraboloidal structure in which an entire surface of each of said lens elements satisfies the following expression:

$$Z = X^2 / (R + \sqrt{(R^2 - (1 + K)X^2)}) + AX^4 + BX^5 + CX^6 + \dots$$

where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, C, ... are aspheric coefficients, and

wherein the radius R of curvature, the conic constant K and the aspheric coefficients A, B, C, ... satisfy the following numerical ranges: $R \geq 0$, $K \leq -1$, $0 < A < 10^{-3}$, and $0 \leq B, C \dots < 10^{-3}$.

Claim 26 (currently amended): A liquid crystal display apparatus, comprising:
a light source for emitting illumination light;
an optical sheet for raising the directivity of the illumination light emitted from said backlight, said optical sheet comprising, on the illumination light emission side thereof, a plurality of lens elements provided successively in a row; and
a liquid crystal panel for displaying an image based on the illumination light emitted from said optical sheet,

wherein if a Z axis is taken in parallel to a normal line direction to said optical sheet and an X axis is taken in a direction of the row of said lens elements, a cross sectional shape in the XZ plane of each of said lens elements has a hyperboloidal or paraboloidal structure in which an entire surface of each of said lens elements satisfies the following expression:

$$Z = X^2/(R + \sqrt{(R^2 - (1 + K)X^2})) + AX^4 + BX^5 + CX^6 + \dots$$

where R is the radius of curvature of a distal end vertex, K is a conic constant, and A, B, C, ... are aspheric coefficients, and

wherein the radius R of curvature, the conic constant K and the aspheric coefficients A, B, C, ... satisfy the following numerical ranges: $R \geq 0$, $K \leq -1$, $0 < A < 10^{-3}$, and $0 \leq B, C \dots < 10^{-3}$.

Claim 27 (previously presented): The optical sheet according to Claim 14, further comprising convex portions provided on the principal face side opposite to the principal face on which said lens elements are provided.

Claim 28 (previously presented): The optical sheet according to Claim 14, wherein the optical sheet including the lens elements is a single-layer element formed by thermal transfer of a desired shape to the sheet.

Claim 29 (previously presented): The optical sheet according to Claim 14, wherein the optical sheet comprises a transparent thermoplastic resin.

Claim 30 (previously presented): The optical sheet according to Claim 29, wherein the transparent thermoplastic resin includes at least one release agent in an amount between about 0.02% and 0.04% by weight of the transparent thermoplastic resin.

Claim 31 (previously presented): The optical sheet according to Claim 29, wherein the transparent thermoplastic resin includes at least one ultraviolet absorbing agent or light stabilizer in an amount between about 0.02% and 0.40% by weight of the transparent thermoplastic resin.